

Amendment
Serial No. 10/657,368

5000-1-466

IN THE CLAIMS:

Kindly replace the claims of record with the following full set of claims:

1. (Currently amended) An E-PON (Ethernet Passive Optical Network) comprising:
 - an OLT (Optical Line Terminal); and
 - a plurality of ONUs (Optical Network Units) connected to the OLT,
 - said OLT including means for assigning bandwidth to the plural ONUs utilizing one or more logical DBACNs (Dynamic Bandwidth Allocation Control Nodes),
wherein the DBACNs and ONUs are arranged in hierarchical stages of a tree, with the ONUs being positioned in a lowermost stage thereof, and DBACNs or ONUs positioned in an intermediate stage are connected to a DBACN positioned in a stage higher than that intermediate stage, each of the DBACN allocates a smaller of a total available allocation-bandwidth and a total requested bandwidth to a lower stage DBACNs or ONUs connected thereto in a priority order of said tree, and
for collecting bandwidth request information from the ONUs and, in a priority order of the ONUs, allocating a smaller of a total requested bandwidth and a total available allocation bandwidth to said plurality of ONUs.
2. (Currently amended) The E-PON of claim 1, wherein said allocating comprises the intermediate step of allocating at least part of said smaller [[one]] of a total requested bandwidth and a total available allocation-bandwidth to at least one of said lower stage DBACNs.

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3. (Cancelled)

4. (Original) The E-PON of claim 1, wherein, in performing said allocating, at least some of the DBACNs select from among at least two elements respectively pre-selected from the group that includes the plural ONUs and one or more DBACNs.

5. (Currently amended) The E-PON of claim 4, wherein the selecting ~~by said at least some of the DBACNs~~ entails switching periodically among the pre-selected elements, and wherein a time rate of the switching varies with a hierarchical stage in said tree of the selecting DBACN.

6. (Cancelled).

7. (Original) The E-PON of claim 1, wherein the assigning means includes a processor and a computer-readable medium for storing a computer program which, when executed by the processor, executes said collecting and said allocating.

8.- 13. (Cancelled)

14. (Currently amended) The E-PON as set forth in claim [[13]] 1, wherein said one or more DBACNs each sequentially select one of the plural ONUs at a time, and ~~preferentially-allocates a bandwidth to the selected one.~~

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15. (Currently amended) The E-PON as set forth in claim 1, ~~wherein the DBACNs and ONUs are arranged in hierarchical stages of a tree, with the ONUs being positioned in a lowermost stage thereof, and DBACNs or ONUs positioned in an intermediate stage are connected to a DBACN positioned in a stage higher than that intermediate stage;~~

~~— wherein the DBACN positioned in the uppermost stage allocates a smaller one of a total available allocation bandwidth and a total requested bandwidth, obtained by collecting bandwidth request information inputted from DBACNs connected thereto from a lower stage, to said DBACNs connected thereto from a lower stage in a priority order of said DBACNs connected thereto from a lower stage; and~~

wherein the DBACNs positioned in stages other than the uppermost stage each collect bandwidth request information inputted from DBACNs or ONUs connected thereto from a lower stage, and output the collected information to a DBACN connected thereto ~~at~~ ~~from~~ a higher stage; and further allocate a bandwidth allocated by said DBACN connected thereto from a higher stage to said DBACNs or ONUs connected thereto from a lower stage in a priority order of said DBACNs or ONUs connected thereto from a lower stage.

16. (Cancelled)

17. (Currently amended) The E-PON as set forth in claim [[16]] 1, wherein the DBACNs are each connected, from an immediately higher stage, to two of the one or more DBACNs and plural ONUs.

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18. (Original) A DBA (Dynamic Bandwidth Allocation) method employing a tree algorithm in an E-PON including an OLT and a plurality of ONUs connected to the OLT, the DBA method being based on steps comprising:

- a) arranging a plurality of logical DBA Control Nodes (DBACNs) in hierarchical stages of a tree with the ONUs being positioned in a lowermost stage thereof, and connecting DBACNs or ONUs positioned in an intermediate stage to a DBACN positioned in a stage higher than that intermediate stage;
- b) sequentially performing a process of causing a DBACN to collect bandwidth request information inputted from DBACNs or ONUs connected thereto from a lower stage, starting from a lowermost DBACN up to an uppermost DBACN in the hierarchy;
- c) causing the uppermost DBACN to allocate a smaller one of a total available allocation-bandwidth and a total requested bandwidth to DBACNs connected thereto from a lower stage in a priority order of said DBACNs connected thereto from a lower stage; and
- d) causing DBACNs positioned in stages below that of the uppermost DBACN to each allocate a bandwidth allocated by a DBACN connected thereto from a higher stage to DBACNs or ONUs connected thereto from a lower stage in a priority order of said DBACNs or ONUs connected thereto from a lower stage.

19. (Original) The DBA method as set forth in claim 18, wherein, during the steps c) and d), the DBACNs each select one of DBACNs or ONUs connected thereto from a lower stage at a time, and preferentially allocate bandwidth to the selected one.

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20. (Original) The DBA method as set forth in claim 18, wherein, at step a), the DBACNs are each connected, from an immediately higher stage, to two of the plural DBACNs and ONUs.